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American Foundryman

A PUBLICATION PRESENTING ASSOCIATION AND CHAPTER ACTIVITIES

Courtesy Pontiac Motor Car Co.

Watcher and Doerfner Elected Directors—See Page 2.
Program for Fall Technical Conference at Michigan University
—See Page 4. Cornell Meeting Announced—See Page 6.

August
1938

Regional Meetings

The ENCOURAGEMENT and assistance to local groups in planning regional meetings has become an activity of major importance to the executive staff of A.F.A.

Obviously, the annual convention can be held in one city each year only and that means that a great many members will be located so far away from that city they cannot arrange for a full representation. The regional meetings bring to each locality the same high type of educational program that we find at the Annual Convention and it is possible to have every interested member of our organizations participate, even to the youngest foreman.

They bring to our local meetings the technical men who are responsible for rapid forward strides in foundry practice and afford an opportunity for all to know them personally and to discuss our problems with them. One cannot enter into the discussion following the presentation of a paper without giving something of benefit and receiving much of benefit in return.

Many regional meetings are held at our best technical colleges and universities, and members of the faculties of their engineering schools participate. What better insurance can we have that the engineers of tomorrow will be correctly informed as to the quality of the product of the modern foundry? We look to these same engineering schools to train the foundry engineers and executives, so important to the future well-being of our industry.

If asked to serve on a committee of arrangement for a regional meeting, do not miss the opportunity. If a meeting is held reasonably near to your place of business, do not fail to have members of your organization attend. The instructive information made available is too valuable to be missed.

Attendance at regional meetings will increase interest to the point of making our organizations better students of **Transactions** and other A.F.A. publications, and that interest alone has a very tangible dollars and cents value to management.

Attendance at regional meetings affords opportunity for renewing and cementing friendships and an opportunity for fellowship that makes us more sympathetic and more tolerant. And somehow that seems to have a very tangible value, too.

H. S. Washburn

Vice President, A.F.A.

A. F. A.
Officers and Staff*

President
MARSHALL POST
Birdsboro Steel Foundry & Machine Co.,
Birdsboro, Pennsylvania

Vice President
H. S. WASHBURN
Plainville Casting Co., Plainville, Conn.

Executive Vice President and Manager of Exhibits
C. E. HOYT*

Secretary
R. E. KENNEDY*

Treasurer and Director of Safety and Hygiene Section
E. O. JONES*

Technical Secretary
N. F. HINDLE*

Assistant Secretary-Treasurer
J. REININGA*

✦

Board of Directors

Terms Expire 1939

JAMES R. ALLAN
International Harvester Co., Chicago, Ill.

D. M. AVEY
American Foundrymen's Association, Chicago, Ill.

CARL C. GIBBS
National Malleable & Steel Castings Co., Cleveland, Ohio

L. N. SHANNON
Stockham Pipe Fittings Co., Birmingham, Ala.

C. E. SIMS
Battelle Memorial Institute, Columbus, Ohio.

Term Expires 1940

D. P. FORBES
Gunite Foundries Corp., Rockford, Ill.

H. B. HANLEY
American Laundry Machinery Co., Rochester, N. Y.

C. J. P. HOEHN
Enterprise Foundry Co., San Francisco, Calif.

THOMAS KAVENY
Herman Pneumatic Machine Co., Pittsburgh, Pa.

J. L. WICK, JR.
Falcon Bronze Co., Youngstown, Ohio

Term Expires 1941

H. BORNSTEIN
Deere & Co., Moline, Ill.

W. H. DOERFNER
Saginaw Malleable Division
General Motors Corp., Saginaw, Mich.

H. S. HERSEY
The C. O. Bartlett & Snow Co., Cleveland, Ohio

G. A. SEYLER
The Lunkenheimer Co., Cincinnati, Ohio

A. WALCHER
American Steel Foundries, Chicago, Ill.

✦

***Headquarters**
Room 1248, 222 West Adams St., Chicago, Ill

American Foundryman

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Annual Meeting of the Board

THE annual meeting of the Board of Directors, recessed from May 20, was held at the Palmer House, Chicago, July 26, with President Post presiding. In addition to President Post, those present were Vice-President H. S. Washburn, Executive Vice-President C. E. Hoyt, Secretary-Treasurer D. M. Avey, Directors Jas. R. Allan, H. Bornstein, L. N. Shannon, D. P. Forbes, Henry B. Hanley, Thomas Kaveny, C. E. Sims, Jas. L. Wick, Jr., H. S. Hersey, Technical Secretary R. E. Kennedy and Director of Safety and Hygiene E. O. Jones.

Directors Elected to Fill Vacancies

Announcement was made of the death of Director F. A. Lorenz, Jr., and the resignation of Director D. O. Thomas. These vacancies on the Board were filled by the election of A. Walcher, vice-president, American Steel Foundries, Chicago, to fill the unexpired term of Mr. Lorenz, and W. H. Doerfner, works manager, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich., to fill the unexpired term of Mr. Thomas.

Officers Elected

In organizing for the year, the Board re-elected C. E. Hoyt Executive Vice-President and Manager of Exhibits.

D. M. Avey, Secretary-Treasurer for the past year, presented his resignation, R. E. Kennedy was elected Secretary, and E. O. Jones, Treasurer and Director of Safety and Hygiene. Norman F. Hindle, Assistant Technical Secretary, was advanced to Technical Secretary, and Miss Jennie Reininga was reelected Assistant Secretary-Treasurer.

Four members of the Board were elected to serve with the president, vice-president and executive vice-president as an executive committee, these being: L. N. Shannon, Stockham Pipe Fittings Co., Birmingham, Ala.; H. Bornstein, Deere & Company, Moline, Ill.; H. S. Hersey, C. O. Bartlett and Snow Company, Cleveland, and Mr. Doerfner.

Reports

Annual reports of the officers were presented, accepted and ordered filed. The Finance Committee, under the chairmanship of Mr. Bornstein, presented a budget of estimated income and expenditures, which was approved.

Mr. Hoyt read invitations from various cities for holding the 1939 convention. These were reviewed and referred to a special committee for determining the time, place and character of the next convention and to report its recommendations to the Board for final decision.

Chapters

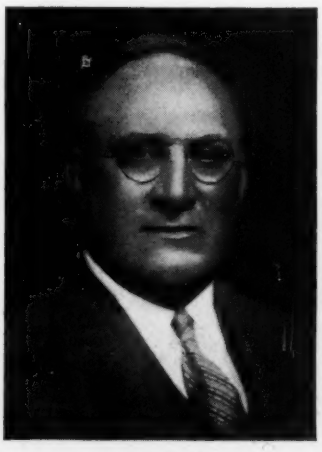
A petition from members of the Province of Ontario for a chapter was approved, this to be known as the Ontario Chapter. A request to change the name of the Milwaukee Chapter to Wisconsin Chapter was also approved.

The Board completed its meeting with the discussion of other reports and recommendations of officers covering future policies.

Board Vacancies Filled by Election of Walcher and Doerfner

EMINENCE in the steel and malleable branches of the castings industry was recognized at the meeting of Board of Directors on July 26, by the election of Alfred Walcher, Vice President, American Steel Foundries, Chicago, and W. H. Doerfner, General Manager, Saginaw Malleable Division of General Motors Corporation, Saginaw, Michigan, to fill two vacancies on the Board. Mr. Walcher was elected to fill the vacancy caused by the recent death of Fred A. Lorenz, Jr., and Mr. Doerfner to fill the vacancy created by the resignation of D. O. Thomas. Mr. Thomas' resignation was due to his having severed his connection with the foundry industry by accepting the position of Vice President of the Bendix Aviation Corporation, South Bend, Indiana.

The Association is indeed fortunate in adding to its directorate two men who have attained such prominent places in the foundry field as have Mr. Walcher and Mr. Doerfner. Mr. Walcher has been identified with the steel casting industry since 1902 when he entered the employment of the American Steel Foundries as pattern foreman. Because of his ability he was soon (1904) placed



A. Walcher

W. H. Doerfner

in charge of the Granite City Works as works manager, which position he held until 1916 when transferred to the Indiana Harbor Works to take part in the production of shell forgings. Following the war in 1919, Mr. Walcher was made assistant vice president in charge of steel foundry operations, and then in 1929 vice president, the position he now holds.

Mr. Doerfner succeeds Mr. Thomas, not only as a director of the A.F.A., but also as general manager of the Saginaw Malleable Division of General Motors Corporation. He had previously been works manager at the Saginaw plant which organization he joined in 1918 when he was employed as timekeeper. In 1924 he was made assistant superintendent. A few months later Mr. Doerfner was sent to Lockport, N. Y., as works superintendent of the Harrison Radiator Division of the General Motors Corporation. He remained there until 1928 when he was returned to the Saginaw Malleable Iron Division as works manager.

Mr. Doerfner was born April 12, 1889, in Saginaw and is the son of John G. and Sadie Anna Doerfner. After obtaining his formal education at the Arthur Hill High School of Saginaw and the Michigan Central State Normal School, he began his business career in 1917 as a clerk with the Valley Sweets Company of Saginaw, the following year becoming geographical engineer for the U. S. Geographical Survey in Georgia and Florida, after which he joined the General Motors Corporation as previously noted.

D. M. Avey Resigns as Secretary-treasurer

D. M. AVEY, formerly editor of The Foundry, joined the staff of A.F.A. following recommendations made to the Board of Directors by a special policy committee that a broader program and new publication policy be inaugurated to stimulate Association activities. The new publication policy finally determined upon by the Board, and recently announced, and the program of activities now in effect, Mr. Avey feels, do not require his services or justify continuing his staff connection and he, therefore, tendered his resignation to the Board at its annual meeting on July 26, 1938.

Mr. Avey joined the A.F.A. in 1920, served on various committees, was chairman of the Program and Papers Committee and of the International Relations Committee for a number of years. He was elected a director in 1931, vice president in 1933, president in 1934 and re-elected in 1935, serving as president at both the Toronto and Detroit conventions. He will continue as a director for another year and as a member of the Board of Awards and of the Advisory Board.

F. A. Lorenz, Jr.

1886 - 1938

WITH deepest regret the Association announces the death, on July 23, of Director Frederick Ayers Lorenz, Jr. Mr. Lorenz, vice-president of the American Steel Foundries, Chicago, was one of the outstanding men of the steel casting industry, and at the recent Cleveland Convention, the Association awarded to him its Joseph S. Seaman Gold Medal "for courageously espousing, and valiantly bringing to fruition, a broad conception of the commercial equation in the foundry industry."

Mr. Lorenz became connected with the American Steel Foundries in 1911 and was advanced steadily to the position of vice-president and general manager of the Indiana Harbor and Pittsburgh plants. As president of the Steel Founders' Society of America, a position he had held for several years, Mr. Lorenz had gained recognition as a leader in organizing the steel casting industry along the highest trade association lines.

Final Call for the Fall Technical Conference

THE final plans for the Second Fall Technical Conference, which will be held at the University of Michigan, Ann Arbor, Michigan, September 15, 16 and 17, are practically complete, and offer to our metallurgists a splendid opportunity for a thorough discussion of some of the more pertinent technical problems facing the various branches of the foundry industry.

This conference, sponsored by the Steel, Malleable, Non-Ferrous and Gray Iron Divisions of the A.F.A., in cooperation with the Detroit Chapter and the University, will be held in the meeting halls of the Michigan Union Building, shown below. This Union Building will also provide good room accommodations for those wishing to make reservations by mail, addressing the Michigan Union Building, Ann Arbor, Mich. Rates are $2.00 to $3.00 single, $4.50 to $6.00 double, $1.00 for dormitory beds. The Union Building also furnishes accommodations for recreation in the game rooms, swimming pool and bowling alleys.

The local committee on arrangements is headed by Richard Schneidewind, Assistant Professor of Metallurgical Engineering, the other members being Professor W. P. Wood, Department of Metallurgical Engineering, and Professor E. J. Ash, Department of Metal Processing.

The Program Committee is also headed by Professor Schneidewind with the following representatives of the Divisions and Chapter:

Gray Iron Division: A. L. Boegehold, General Motors Corporation.

Steel Division: F. A. Melmoth, Detroit Steel Castings Co.

Malleable Division: H. M. Wright, Michigan Malleable Castings Co., and J. H. Lansing and E. Touceda, Malleable Founders' Society.

Non-Ferrous Division: E. R. Darby, Federal-Mogul Corporation.

Detroit Chapter: V. A. Crosby, Climax-Molybdenum Co.; Fred J. Walls, International Nickel Co.; R. G. McElwee, Vanadium Corporation of America, and R. B. Crawford, Atlas Foundry Co.

Program

Thursday—September 15

A.M. *REGISTRATION*—Michigan Union Bldg.

A.M. *TECHNICAL SESSION—MALLEABLE IRON*

Chairman, Homer M. Wright, Michigan Malleable Iron Co., Detroit, Mich.

Subject: *Annealing Methods*

Annealing

Discussion Leader: J. H. Lansing, Malleable Founders' Society, Cleveland, O.

Controlled Atmospheres

Discussion Leader: John A. Dow, Holcroft & Co., Detroit, Mich.

P.M. *TECHNICAL SESSION—NON-FERROUS*

Chairman, E. R. Darby, Federal-Mogul Corp., Detroit, Mich.

Subject: *Age Hardening*

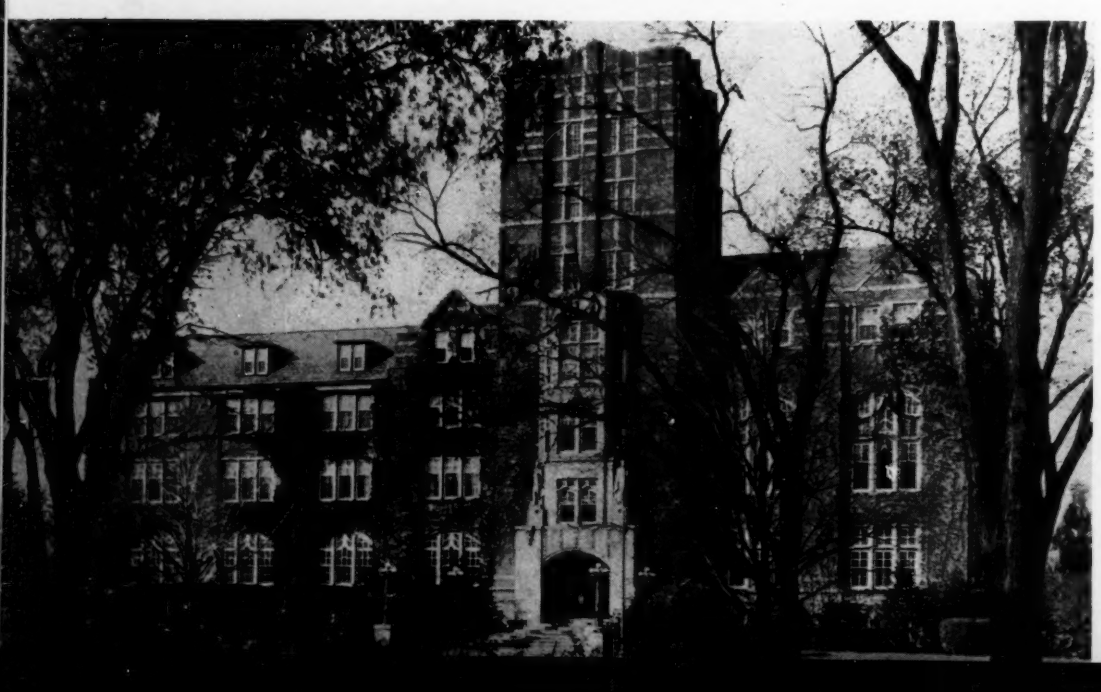
A Description of the Age Hardening Process as Applied to Castings

L. W. Kempf, Aluminum Company of America, Cleveland, O.

High Conductivity, Age Hardening Copper-Chromium Alloys

A. B. Kinzel, Union Carbide & Carbon Research Laboratories, New York, N. Y.

Discussion



Michigan Union Building, where the Second Fall Technical Conference will be held

Friday—September 16

A.M. *TECHNICAL SESSION—CAST IRON THEORY*

Chairman, V. A. Crosby, Climax Molybdenum Co., Detroit, Mich.

Transformation Rates of Austenite in Cast Iron

Prof. W. P. Wood, Dr. D. W. Murphy and C. D. D'Amico, University of Michigan

Discussion

Effect of Under-Cooling on the Nature of the Graphite Pattern in Gray Cast Irons

Prof. R. Schneidewind and C. D. D'Amico, University of Michigan

Discussion

P.M. *TECHNICAL SESSION—CAST STEEL*

Chairman, F. A. Melmoth, Detroit Steel Castings Co., Detroit, Mich.

Highly Alloyed Heat and Scale Resistant Steel Castings

James Corfield, Michigan Steel Castings Co., Detroit, Mich.

Discussion

Cast Steels in Automotive Work

R. H. McCarroll, Chief Metallurgist, Ford Motor Co., Detroit, Mich.

Discussion

The Spectrograph as a Foundry Tool

A. M. Sampson, Campbell, Wyant and Cannon Foundry, Muskegon, Mich.

Discussion

Evening. *CONFERENCE DINNER*

Saturday—September 17

A.M. *TECHNICAL SESSION—GRAY IRON*

Chairman, A. L. Boegehold, General Motors Research Corp., Detroit, Mich.; Vice-Chairman, Fred J. Walls, International Nickel Co., Detroit, Mich.

Some Factors Affecting Properties of Superheated Cast Iron

Dr. C. H. Lorig, Battelle Memorial Institute, Columbus, O.

Discussion

The Influence of Composition on the Properties of Electric Furnace Irons

R. G. McElwee, Vanadium Corp. of America, Detroit, Mich.

Discussion

W. J. Cameron to Address Conference Dinner Meeting

The conference dinner, the evening of the 16th, will be a notable occasion as the committee has secured as the dinner speaker Mr. W. J. Cameron of the Ford Motor Company. Mr. Cameron is known throughout America for his splendid comments on business and national affairs on the Ford Sunday Evening Hour broadcasts.

Laboratories Open for Inspection

The University of Michigan is well known for its department of engineering research, of which the director is Dr. A. E. White, who has contributed many papers on cast metals research to the Association's annual meetings. Many of the special research laboratories of this department and others of the University will be open for inspection. Following the talk Friday afternoon by Mr. Sampson on the spectrograph as a foundry tool, the spectrographic laboratory will be visited and a demonstration will be staged, using alloy cast iron samples, making a complete analysis in the very short time possible by this method.

East Engineering Building, University of Michigan, in which are the Laboratories of the Department of Engineering Research and Metal Processing

Second Cornell Regional Conference Scheduled for November

WITH Henry B. Hanley, director of A.F.A., and foundry manager, American Laundry Machinery Co., Rochester, N. Y., as chairman of the committee to arrange the program, the Second Regional Foundry Conference to be held at Cornell University is well under way. The conference, which will be held at Ithaca, N. Y., November 25 and 26, is being sponsored by the Buffalo Chapter, Syracuse Foundrymen's Association, and A.F.A. members in the territory in cooperation with the University.

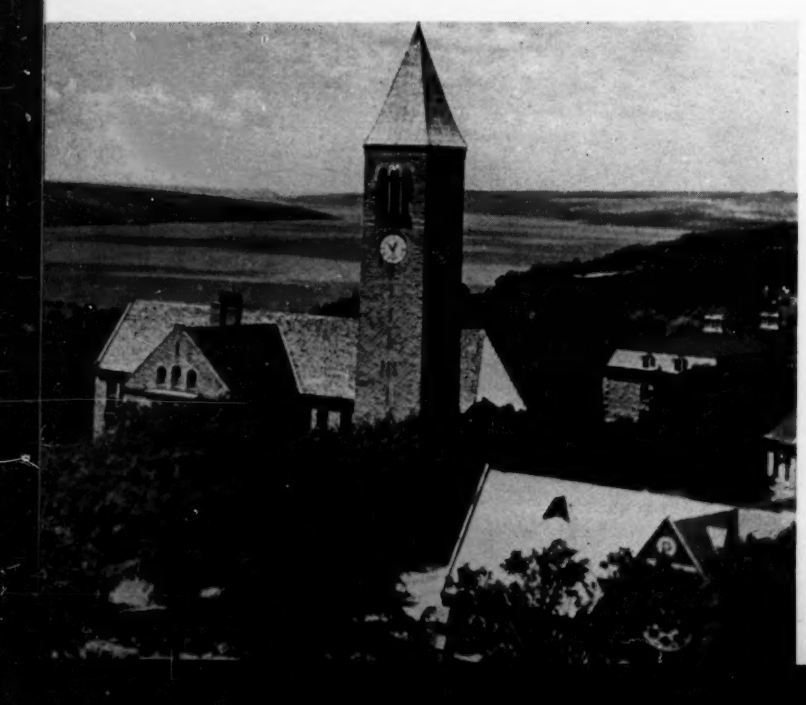
Members of the committee, in addition to Mr. Hanley, as chairman, are Professor A. C. Davis, Cornell University; R. K. Glass, treasurer, Buffalo Chapter, and metallurgist, Republic Steel Corporation, Buffalo; M. W. Pohlman, chairman, Buffalo Chapter, and vice-president, Pohlman Foundry Co., Buffalo; H. H. Judson, foundry superintendent, Goulds Pumps, Inc., Seneca Falls, N. Y., and J. L. Lonergan, general manager, Morris Machine Works, Baldwinsville, N. Y. Mr. Lonergan and Mr. Judson represent the Syracuse Foundrymen's Association.

The committee has set as its objective a conference which will give instruction of a fundamental character, appealing especially to the foundryman interested in shop problems.

Sessions are planned to cover malleable practices, sand control, prevention of dust hazards, cupola practice, gating and risering, steel shop practice and elementary metallurgy. In addition, Professor Mason of the University will repeat the demonstration of crystallization which proved of such interest at last year's conference.

Complete details of the program will appear in future issues of *American Foundryman*.

Overlooking beautiful Lake Cayuga from Cornell Campus, where Northwestern New York Foundry Conference will be held



Calendar of Fall Foundry Conferences

September 15-16-17—Ann Arbor, Michigan—Fall Technical Conference. Sponsored by A.F.A. Divisions and University of Michigan with Detroit Chapter cooperating. Chairman of committee: R. Schneidewind, Dept. of Metallurgical Engineering, University of Michigan, Ann Arbor, Mich.

October 7-8—Rolla, Missouri—Second Annual Rolla Regional Conference. Sponsored by St. Louis Chapter in cooperation with Missouri School of Mines and Metallurgy. Chairman of committee: Louis J. De[illegible]arois, c/o Pickands Mather & Co., St. Louis, Mo. For program see pages 5-6, July issue, *American Foundryman*.

October 14-15—Iowa City, Iowa—Third Annual Iowa Conference. Sponsored by Quad City Chapter, Northern Illinois-Southern Wisconsin Chapter, Northern Iowa Foundrymen's Association, cooperating with State University of Iowa. Chairman of committee: Horace Deane, c/o Deere & Co., Moline, Ill. For program see pages 6-7, July issue, *American Foundryman*.

October 27-28-29—West Lafayette, Indiana—Regional Foundry Conference. Sponsored by Chicago Chapter in cooperation with Purdue University. Chairman of committee: Harold W. Johnson, Northwestern Foundry Co., 662 W. Roosevelt Road, Chicago. Tentative Schedule, pages 7-8, July issue, *American Foundryman*. Final program in October issue.

November 25-26—Ithaca, N. Y.—Second Northwestern New York Regional Conference. Sponsored by Buffalo Chapter, Syracuse Foundrymen's Association and A.F.A. members in district. Chairman of committee: Henry B. Hanley, American Laundry Machinery Co., Rochester, N. Y. Program will appear in October issue of *American Foundryman*.

Chapter Directory

Chicago Chapter

Meetings—2nd Monday, monthly, Medinah Club of Chicago.
Chairman—L. H. Rudesill, Griffin Wheel Co.
Vice-Chairman—C. E. Westover, Burnside Steel Foundry Co.
Treasurer—C. C. Kawin, Chas. C. Kawin Co.
Secretary—L. L. Henkel, Interlake Iron Corp.
Directors—H. Kenneth Briggs, Western Foundry Co.
J. D. Burlie, Western Electric Co.
J. J. Fox, Wisconsin Steel Co.
A. W. Gregg, Whiting Corp., Harvey, Ill.
H. W. Johnson, Greenlee Foundry Co.
W. C. Packard, National Engineering Co.
W. H. Parker, American Steel Foundries, East Chicago, Ind.
G. P. Phillips, International Harvester Co.
C. O. Thieme, H. Kramer & Co.
James Thomson, Continental Roll & Steel Foundry Co., East Chicago, Ind.
A. W. Weston, Chicago Hardware Foundry Co., North Chicago, Ill.
L. J. Wise, Chicago Malleable Castings Co.

Northeastern Ohio Chapter

Meetings—2nd Thursday, monthly, Cleveland Club, Cleveland.
Chairman—L. P. Robinson, Werner G. Smith Co.
Vice-Chairman—Charles Seelbach, Forest City Foundries Co.
Treasurer—R. F. Lincoln, Osborn Mfg. Co.
Secretary—J. H. Tressler, Hickman Williams Co.
Directors—Homer Britton, Cleveland Cooperative Stove Co.
F. R. Fleig, Smith Facing & Supply Co.
E. F. Hess, Ohio Injector Co., Wadsworth.
D. J. McAvoy, Grabler Mfg. Co.
B. G. Parker, Youngstown Foundry & Machine Co., Youngstown.
Marcel Reymann, Atlantic Foundry Co., Akron.
S. P. Schloss, Superior Foundry Co.
Frank G. Steinebach, The Foundry.
Fred A. Stewart, National Malleable & Steel Castings Co.

Quad City Chapter

Meetings—3rd Monday, monthly, rotate between Davenport, Iowa; Moline, East Moline and Rock Island, Ill.
Chairman—M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill.
Vice-Chairman—H. A. Deane, Deere & Co., Moline, Ill.
Secretary-Treasurer—J. Morgan Johnson, Tri-City Mfrs. Assn., Moline, Ill.
Directors—P. T. Bancroft, Moline, Ill.
H. Bornstein, Deere & Co., Moline, Ill.
C. H. Burgston, Deere & Co., Moline, Ill.
T. J. Frank, Frank Foundries Corp., Davenport, Iowa.
F. O. Gorman, John Deere Spreader Works, E. Moline, Ill.
A. E. Hageboeck, Frank Foundries Corp., Moline, Ill.
H. F. Henninger, International Harvester Co., Rock Island, Ill.
John H. Ploehn, French & Hecht, Inc., Davenport, Iowa.
W. O. McFatridge, International Harvester Co., Rock Island, Ill.

Detroit Chapter

Meetings—3rd Thursday, monthly, Fort Shelby Hotel, Detroit.
Chairman—Ira F. Cheney, Griffin Wheel Co.
Vice-Chairman—Harry W. Dietert, H. W. Dietert Co.
Secretary—Harry J. Deutsch, Aluminum Co. of America.
Treasurer—Wm. W. Bowring, F. B. Stevens, Inc.
Directors—Glenn Coley, Detroit Edison Co.
R. B. Crawford, Atlas Foundry Co.
J. H. Crawley, Pontiac Motor Co.
L. G. Korte, Atlas Foundry Co.
D. J. Meloche, American Radiator Co.
J. D. Stoddard, Detroit Testing Laboratory.

St. Louis District Chapter

Meetings—2nd Thursday, monthly, St. Louis.
Chairman—J. O. Klein, Southern Malleable Iron Co.
Vice-Chairman—Lee Everett, The Key Co.
Secretary-Treasurer—J. W. Kelin, Federated Metals Div., American Smelting & Refining Corp.
Directors—M. A. Bell, M. A. Bell Co.
O. J. Belzer, Banner Iron Works.
L. J. Desparois, Pickands Mather & Co.
G. S. Haley, Century Foundry Co.
G. W. Mitsch, American Car & Foundry Co.
L. Reiber, United Collieries, Inc.

Metropolitan Philadelphia Chapter

Meetings—2nd Friday, monthly, Engineers' Club, Philadelphia.
Chairman—H. L. Henszey, The Carborundum Co., Philadelphia.
Vice-Chairman—W. C. Hartmann, Bethlehem Steel Co., Bethlehem, Pa.
Secretary-Treasurer—W. B. Coleman, W. B. Coleman & Co., 1920 W. Indiana Ave., Philadelphia.
Directors—C. A. Bever, Bethlehem Steel Co., Bethlehem, Pa.
J. T. Fegley, North Bros. Mfg. Co.
G. L. Coppage, Pusey & Jones Corp., Wilmington, Del.
L. W. Harris, Link-Belt Co.
R. J. Keeley, Ajax Metal Co.
John H. S. Spencer, H. W. Butterworth & Sons Co., Bethayres, Mont. Co., Pa.

Wisconsin Chapter

Meetings—3rd Friday, monthly, Schroeder Hotel, Milwaukee.
Chairman—Roy M. Jacobs, Standard Brass Works.
Vice-Chairman—Wm. J. McNeill, Federal Malleable Iron Co.
Treasurer—Wm. J. Donnelly, Smith Steel Foundry Co.
Secretary—B. D. Claffey, General Malleable Corp., Waukesha.
Directors—H. R. Donald, Interstate Supply & Equipment Co.
Ray Flansburg, Belle City Malleable Iron Co., Racine.
A. F. Genthe, Harnischfeger Corp.
Walter Gerlinger, Walter Gerlinger, Inc.
R. J. Kelly, American Skein & Foundry Co.
R. S. MacPherran, Allis-Chalmers Mfg. Co.
A. C. Ziebell, Universal Foundry Co., Oshkosh.

Northern California Chapter

Meetings—2nd Friday, monthly.
Chairman—John D. Fenstermacher, Columbia Steel Co.
Vice-Chairman—S. D. Russell, Phoenix Iron Works, Oakland.
Secretary-Treasurer—G. L. Kennard, San Francisco.
Directors—J. K. Benedict, H. C. Donaldson & Co., San Francisco.
F. C. Holman, Tuolumne Foundry & Machine Works, Sonora.
I. L. Johnson, Pacific Steel Casting Co., Berkley.
H. L. Martin, Vulcan Foundry Co., Oakland.
M. M. Morison, Balfour, Guthrie & Co., Ltd., San Francisco.
R. E. Noack, Monarch Foundry & Engineering Corp., Stockton.
W. A. Schimmelpfennig, California Foundries, Inc., Oakland.
M. G. Wilson, Wilson & Nutwell, Fresno.

Birmingham District Chapter

Meetings—3rd Friday, monthly, Tutwiler Hotel, Birmingham.
Chairman—C. B. Saunders, Tennessee Coal, Iron & R. R. Co.
Vice-Chairman—R. C. Harrell, Stockham Pipe Fittings Co.
Secretary-Treasurer—W. O. McMahon, Sloss-Sheffield Steel & Iron Co.
Directors—J. M. Franklin, Central Foundry Co.
C. A. Hamilton, Alabama Pipe Co.
J. E. Reynolds, U. S. Pipe & Foundry Co.
W. L. Roueche, Sr., McWane Cast Iron Pipe Co.
L. N. Shannon, Stockham Pipe Fittings Co.

Buffalo Chapter

Meetings—1st Monday, monthly, King Arthur's Restaurant, Buffalo.
Chairman—M. W. Pohlman, Pohlman Foundry Co., Inc.
Vice-Chairman—W. J. Corbett, Atlas Steel Casting Co.
Treasurer—R. K. Glass, Republic Steel Corp.
Secretary—J. R. Wark, Queen City Sand & Supply Co.
Directors—J. P. Begley, Pratt & Letchworth Co., Inc.
T. H. Burke, Otis Elevator Co.
J. McCallum, Lumen Bearings Co.
V. M. Mazurie, Buffalo Foundry & Machine Co.
W. S. Miller, Chas. C. Kawin Co.
Lynn Reynolds, Worthington Pump & Machinery Co.
R. T. Rycroft, Jewell Alloy & Malleable Co., Inc.

Southern California Chapter

Meetings—4th Thursday, monthly.
Chairman—J. G. Coffman, Los Angeles Steel Castings Co., Los Angeles.
Vice Chairman—Bert Oldfield, Alhambra Foundry Co., Alhambra.
Secretary—M. S. Robb, Bethlehem Steel Co., Los Angeles.
Treasurer—Chas. Gregg, Reliance Regulator Co., Alhambra.
Directors—Earl Anderson, Enterprise Foundry Co., Los Angeles.
E. F. Green, Axelson Mfg. Co., Los Angeles.
Wm. Feltes, Westlectric Castings, Inc., Los Angeles.
Robert Gregg, Reliance Regulator Co., Alhambra.
S. R. Kimberly, Los Angeles Steel Casting Co., Los Angeles.
D. E. Lingenfelter, Quality Foundry Co., Los Angeles.
G. W. Merrefield, Kay-Brunner Steel Products Co., Los Angeles.
J. H. Wilkins, Dayton & Waldrip Co., Los Angeles.
J. E. Wilson, Climax Molybdenum Co., Los Angeles.

Metropolitan New York-New Jersey Chapter

Meetings—3rd Monday, monthly.
Chairman—D. J. Reese, International Nickel Co., New York.
Vice-Chairman—W. E. Day, International Motor Co., New Brunswick, N. J.
Secretary—T. J. Wood, Robins Conveying Belt Co., Passaic, N. J.
Treasurer—Samuel Frankel, H. Kramer Co., New York, N. Y.
Directors—R. J. Allen, Worthington Pump Co., Harrison, N. J.
R. E. Nesbitt, Pratt Institute, Brooklyn, N. Y.
W. A. Phair, Iron Age, New York, N. Y.
J. W. Reid, Robins Conveying Belt Co., Passaic, N. J.
Sam Tour, Lucius Pitkin, Inc., New York, N. Y.

Northern Illinois and Southern Wisconsin Chapter

Chairman—John Clausen, Greenlee Bros. & Co., Rockford, Ill.
Vice-Chairman—G. J. Landstrom, Sundstrand Machine Tool Co., Rockford, Ill.
Technical Secretary—H. C. Winte, Fairbanks, Morse & Co., Beloit, Wis.
Secretary-Treasurer—G. K. Minert, Gunite Foundries Corp., Rockford, Ill.
Directors—August Christen, Arcade Mfg. Co., Freeport, Ill.
C. M. Dale, Liberty Foundries Co., Rockford, Ill.
W. L. Davy, W. L. Davy Pump Co., Rockford, Ill.
W. E. Goff, J. I. Case Co., Rockford, Ill.
H. F. Halverson, Beloit Foundry Co., Beloit, Wis.
Eli Johnson, Greenlee Bros & Co., Rockford, Ill.
P. A. Paulson, Gunite Foundries Corp., Rockford, Ill.
A. W. Wiegart, Geo. D. Roper Corp., Rockford, Ill.
George Zabel, Fairbanks, Morse & Co., Beloit, Wis.

Ontario Chapter

Chairman—Joseph Sully, Sully Brass Fdry., Ltd., Toronto.
Vice-Chairman—D. J. Macdonald, Dominion Radiator & Boiler Co., Toronto.
Secretary-Treasurer—S. R. Francis, Metals & Alloys, Ltd., Toronto.
Directors—W. R. Barnes, Wm. R. Barnes Co., Ltd., Hamilton.
D. Cameron, John T. Hepburn, Ltd., Toronto.
N. B. Clarke, Steel Co. of Canada, Ltd., Hamilton.
O. W. Ellis, Ontario Research Foundation, Toronto.
C. H. Ley, Dominion Wheel & Fdries, Ltd., Toronto.
C. C. Macdonald, Fredercik B. Stevens Co. of Canada, Ltd., Toronto.
J. J. McFadyen, Galt Malleable Iron Co., Ltd., Galt.
D. M. Storie, Fittings, Ltd., Oshawa.

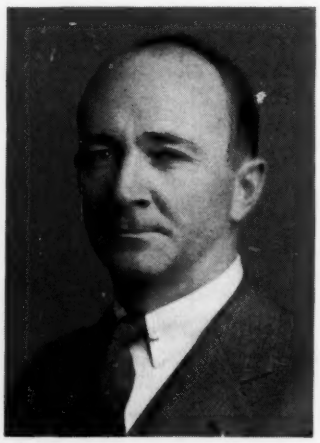
Canadian Section

Chairman—Jos. Sully, Sully Brass Foundry, Ltd., Toronto.
Vice-Chairman—H. J. Roast, Canadian Bronze Co., Montreal.
Secretary-Treasurer—D. J. McDonald, Dominion Radiator & Boiler Co., Ltd., Toronto.
Directors—Maj. L. L. Anthes, Anthes Foundry, Ltd., Toronto.
Emil Drolet, La Campagnie, F. X., Drolet, Quebec, P. Q.
O. W. Ellis, Ontario Research Foundation, Toronto.
W. C. Fletcher, Canadian Car & Foundry Co., Ltd., Montreal.
J. T. Hepburn, John T. Hepburn, Ltd., Toronto.
J. S. Hoyt, T. McAvity & Sons, Ltd., St. John.
A. C. Neal, Enamel & Heating Products, Ltd., Sackville, N. B.
Frank A. Sherman, Dominion Foundries & Steel, Ltd., Hamilton, Ontario.
A. G. Storie, Fittings, Ltd., Oshawa, Ontario.

Ontario Chapter Petition Granted

AT the time of the Cleveland convention, the Canadian Section held a meeting and considered the possibilities of forming an Ontario Chapter. After some deliberation, this movement was approved with the understanding that the Canadian Section would also be maintained to provide for collective action on the part of all Canadian members. The necessary number of members then presented a petition to the Board of Directors, which was approved at the Board meeting, July 26. Accordingly, our fourteenth chapter appears above in the chapter directory.

Joseph Sully, Sully Brass Foundry, Toronto, was elected chairman of the chapter and re-elected chairman of the Canadian Section. D. J. MacDonald, elected as vice-chairman of the chapter, remains as secretary-treasurer of the Canadian Section, while S. R. Francis, manager, Metals and Alloys, Ltd., Toronto, is secretary-treasurer of the chapter. Harold J. Roast, vice-president, Canadian Bronze Co., Ltd., Montreal, remains as vice-chairman of the Canadian Section. In the first issue of American Foundryman, Mr. Roast's election as chairman of the A.F.A. Non-Ferrous Division was announced.



Joseph Sully
Chairman Ontario Chapter

Our Canadian members are to be congratulated on this new move and the several meetings which they have held this past year as a section give every indication for the future success of the Ontario Chapter and Canadian Section.

Junior Foundrymen of America Formed Project Sponsored by Chicago Chapter

By Melvin Lipschultz, Secretary, J.F.A.

AT THE beginning of the 1937-38 season, the Chicago Chapter extended a special invitation to apprentices and students in Smith-Hughes work in Chicago technical high schools to attend its meetings. The move has borne fruit and bids fair to result in a national organization for foundry apprentices and students of foundry practice enrolled under the Smith-Hughes Act.

Following the invitation, R. W. Schroeder, instructor in foundry practice, Crane Technical High School, brought several members of his classes to meetings regularly, the number increasing from meeting to meeting. The boys became so enthusiastic that in December, 1937, they formed the Junior Foundrymen of America and petitioned the Chicago Chapter to act as sponsor and director of their activities.

F. Mastrantonio
President J.F.A.

William Wick
Treasurer J.F.A.

On June 6, 1938, a meeting was held in Crane Technical High School for the purpose of presenting the organization with a charter issued by the State of Illinois. H. W. Johnson, Greenlee Foundry Co., presided and opened the meeting by introducing the officers of the J.F.A., as follows:

President—F. Mastrantonio.
Vice President—D. Saviano.
Treasurer—W. Wick.
Secretary—M. Lipschultz.
Sergeant at Arms—L. Kozlowski, A. Speer.
Chairman of Board of Directors—R. LaRocca.

Following the introduction of the Chicago Chapter committee on Junior Foundrymen of America and the reading of the preamble of the constitution by President Mastrantonio, R. E. Kennedy, technical secretary of A.F.A.; A. W. Gleason, superintendent of foundries, Carnegie-Illinois Steel Corp., South Works; C. C. Kawin, C. C. Kawin Co.; A. L. Armantrout, ass't supt. of industrial relations, Carnegie-Illinois Steel Corp., South Works, gave short talks. R. W. Schroeder, instructor in foundry practice at Crane, also spoke on what could be accomplished by organizations of that type. Mr. Schroeder addressed his remarks especially to instructors and students from other schools who were attending the meeting. The Chicago Board of Education was represented by A. M. Sullivan, director of vocational education, who said that the organization was highly approved by the Board.

Following this part of the program, 48 students were formally enrolled as members of the Junior Foundrymen of America, Crane Chapter. The following were elected to honorary membership: A. L. Armantrout, W. Baumrucker, Crane Technical High School; V. G. Cornelius, Carnegie-Illinois Steel Corp.; G. A. Davis, Crane Technical High School; A. W. Gleason, N. F. Hindle, A.F.A.; H. W. Johnson, C. C. Kawin, C. C. Kawin Co.; R. E. Kennedy, A.F.A.; R. W. Schroeder, J. S. Turek, Crane Technical High School.

P. T. Bancroft, Moline, Ill., and A. G. Storie, Oshawa, Canada, watch Roy Vopolicky, apprentice with Pattern Engineering Co., Cleveland, making a pattern in the Cleveland Trade School operating exhibit at the Cleveland convention

Program Committee Invites Papers for 1939 Convention

THE Committee on Papers for the 1939 convention at this time extends an invitation to members to submit manuscripts for review for the next annual meeting. While the time and place for the convention have not yet been decided upon, it is not too early to offer a paper or suggestions for papers and names of possible authors.

The Committee is especially anxious to give all members a chance to express their views as to what subjects should be covered. It further realizes that many members who have not in the past presented papers, have much valuable material which would make excellent contributions to the foundry industry. The Committee would also be glad to hear from the younger members as to what type of papers they would prefer. Address all correspondence to Chairman of Program Committee, American Foundrymen's Association, 222 W. Adams St., Chicago.

Steel Founders' Society Employs Technical Engineer

C. W. BRIGGS, physical metallurgist for the Naval Research Laboratories, Washington, D. C., has accepted the position of technical engineer for the Steel Founders' Society of America, and will assume this position in October.

Mr. Briggs is well known in the A.F.A. for his research work on steel casting, for which at the 1937 convention in Milwaukee he was given the William H. McFadden gold medal. He has been especially active in Steel Division committee work, as chairman of the Committee on Radiography and member of the executive committee, and has presented many papers before the division's annual sessions, his most recent paper being that contributed with his co-workers, Messrs. R. A. Gezelius and A. R. Donaldson, before the 1938 meeting on the subject of Steel Casting Design for the Engineer and Foundryman.

Mr. Briggs is a graduate of Stanford University, and since his graduation has devoted most of his time to research work for the Navy.

Gray Iron Society Sponsors Survey

A CRITICAL study of the world's technical literature on the properties of gray iron has been started at Battelle Memorial Institute by the Gray Iron Founders' Society, Inc., Cleveland. W. W. Rose, executive vice-president of the Society, states that it is planned to present the data gathered at Battelle in a form particularly adapted to the needs of the sales and service organizations of the member foundries.

A. Lockwood, Director Buffalo Chapter, Dies

ALBERT LOCKWOOD, director of the Buffalo Chapter, and director of purchases and plant executive, Lumen Bearing Co., Buffalo, died July 1.

Mr. Lockwood, who had been very active in the formation of the Buffalo Chapter, will be succeeded on the chapter Board of Directors by John McCallum, secretary of the Lumen Bearing Co.

Pattern Making Interests Emphasized

ACCORDING to word received from Geo. L. Kennard, secretary, Northern California Chapter, the Chapter during these summer months is campaigning for members who are amongst those allied with pattern shops. Several such members have been secured, and the Chapter intends to devote more attention to this branch of the industry in its future meetings.

This trend is in line with the national Association program, which has inaugurated a pattern session as an annual convention feature beginning with the Cleveland convention.

New Members

Since the publication of the list of new members in the July issue, the following have been added:

Personal

John P. Webb, Redding Iron Works, Redding, Calif.

Affiliate

W. E. Fearn, foundry superintendent, Dominion Foundries & Steel, Ltd., Hamilton, Can.

Edward A. Hartmann, chemist, Chas. C. Kawin Co., Chicago, Ill.

F. A. Loosley, works manager, Dominion Foundries & Steel, Ltd., Hamilton, Can.

R. E. Martin, metallurgical apprentice, Maynard Electric Steel, Milwaukee, Wis.

Harold B. Moran, sales representative, Wisconsin Steel Co., Chicago, Ill.

R. J. Phoenix, chief inspector, Dominion Foundries & Steel, Ltd., Hamilton, Can.

James Quinn, general foreman, National Malleable & Steel Castings Co., Cleveland, Ohio.

C. J. Rittinger, foundry metallurgist, Riley Stoker Corp., Detroit, Mich.

S. E. Robinson, Fittings, Ltd., Oshawa, Can.

Michael Warchol, metallurgist, Atlas Foundry Co., Detroit, Mich.

Foreign

Librarian, Newcastle Technical College, Newcastle, N. S. W., Australia.

Safety

The Relation of Management to Safety†

By W. R. Elliot,* Cleveland, Ohio

THE record in accident prevention work at The Otis Steel Company is very gratifying to all of us who have had a part in bringing about that improvement. There is no phase of our business that gives us more satisfaction than the fact that we have reduced both the frequency and severity of accidents occurring in our plants. On the other hand, there is nothing that challenges us more than to further consider that record and to see how very much still remains to be done.

We are in the steel industry, an industry that has had a place well up among the leaders for its accomplishments in safety work, one that has not only improved its own experience, but has set a good example for others and encouraged them to do likewise. We propose, as far as it may be possible, to keep pace with our industry, and to help our industry keep pace with others. We have taken the position that we will prevent accidents and not simply regret them or accept them as inevitable. We do not believe that they must happen, and we intend to do something about it. We have already done something about it, as evidenced by the following record:

Accidents Reduced

For the year 1933, our frequency was 28.27, severity 8.01. This has been progressively reduced until in 1937 the frequency is 5.39 and severity 2.44. This constitutes a reduction of 81 per cent in frequency and 70 per cent in severity. During the month of April, 1938, the entire plant operated without a single lost time accident, the hours of exposure being 371,426. Other months in which no accident record was experienced were September, 1934, with 376,325 hours of exposure and August, 1935, with 728,178 hours of exposure. We believe that safety starts at the top, and in our company we are putting that belief into practice.

The title of this discussion is "The Relation of Management to Safety." Suppose we reverse that phrase and ask ourselves: What is the relation of safety to management? It is no exaggeration to say that the kind, character and effectiveness of the safety campaign carried on in the plants of any company constitute an excellent yard stick by which to measure the management of that company. I can not believe that you will ever find a vigorous and effective safety campaign carried on in the plants of a company directed by a slack, disinterested or inefficient management. It has been our experience that safety work is properly a function of the operating departments, and that safety should go hand in hand with, and head the other tenets of, the production man's creed. It should be: *Safety, quality and production.*

All Work Toward Safety

It is our conception of an industrial organization that, regardless of rank, we all work together on a basis of mutual interest towards a common goal, and that the greatest difference from one rank to another lies in the measure of responsibility that each one bears. That being so, management must bear the responsibility of initiating and sustaining the safety program. Since management is the body which formulates the policies under which the company shall operate, it must then originate the policy under which the safety work shall be done in the plants. That policy will be the foundation upon which the actual structure is built.

The policy must be sincere. It must be earnest. It must be well planned and actively supported. No mere lip service, no wishful thinking, no passive or grudging approval, as the management's attitude towards safety, will ever be productive of an improvement in the accident record. Without genuine and active management support, any safety campaign is bound to fail. Such support must be apparent to the workers and prove its existence by visible signs, such as mechanical guards, good lighting, bulletin boards with up-to-date safety literature, management interest and participation in some of the safety rallies, prompt recognition of a good record and censure of a poor one.

The actual work on the firing line, of course, must be done by the operating superintendents, foremen and sub-foremen and the workers, acting

*Assistant to the President and in charge of operations, The Otis Steel Co.

†Abstracted from a paper by the same title presented at the All Ohio Safety Conference, Coulmbus, Ohio, May 11, 1938.

with the advice and guidance of the safety engineer and his staff. However, that work will not be done, or at least, will not be thoroughly done, unless everyone in the organization fully realizes that the management means business with regard to safety and that a supervisor is judged fully as much on his accident record as he is on his production and costs. Once the supervisors are convinced of this attitude on the part of management, the safety problems will be approached and handled in the same spirit as production problems now are.

Management Must Finance Safety

Management realizes that, in addition to inspirational force, it must give to the safety program financial support as generously as the company's means will permit. No one of us believes that the financial side of this question should rank in importance with the humanitarian side, but it is definitely not out of place to say it still deserves an important place in our considerations. Accidents cost money, and we all help to pay the bill. Not only that, but accidents reduce workers' incomes, and by so doing, reduce purchasing power, which directly affects business, because the workers are not only the producers of the products, but they are also the buyers, who constitute the chief part of our ultimate markets. We spend tremendous sums of money to educate our people, spend still further to train them in industry, and permit that great investment to be lost through death or mutilation by accident. In giving the financial support that they need to safety campaigns throughout the country, all industry may well be casting its bread upon the waters, and, in part, protecting its own investment. In our own case, this has meant to us a saving of $1.00 per $100.00 of payroll, and you can readily estimate what that would mean in an average year.

It would be useless, however, for industry to spend money to financially support safety work and stop there. There is no need for me to tell you what percentage of accidents would be eliminated by mechanical guards only. There must be, on the part of the worker, repeated safe thinking and repeated safe acting, until such thoughts and actions become habitual. I use the word "habitual" advisedly here because, as one noted speaker expressed it before a Safety Congress a year ago, habits are the strongest forces in human life, stronger than emotion, and if of long duration, they become almost instinctive reactions.

One other thing that we believe will contribute largely to the effectiveness of the safety work is a harmonious employer-employee relationship. Above all others, safety work should be one ground on which employer and employees may meet in perfect accord. There can be no misunderstanding about their mutual interest in this phase of their work. We believe that such a harmonious relationship is important because it will not only induce a more receptive attitude on the part of the workers toward safety principles and their practice, but it will also be productive of many worthwhile suggestions as to the removal of hazards and the prevention of accidents.

We believe it to be generally true throughout industry that management has, in increasing degree, realized and willingly assumed its responsibilities and obligations towards safety work. We believe that, more and more, management has spent its time, given its efforts and its money to make plants safe for the workers. We believe that management, in general, looks back over the past two decades with some justifiable degree of gratification, realizing that it has had some part in saving the 200,000 lives that would have been lost, had the death rate continued at the 1913 rate.

Management realizes that there is no work to which it could turn its hand that would be more worthy than to have had a part in that accomplishment. Influenced primarily by humanitarian motives, and further urged by the economic aspects of waste and unnecessary cost, management has made safety a watchword. It looks forward with full realization of the difficulties yet to be surmounted and the problems yet to be faced, problems that shift and change with the constantly changing industrial set-up; yet it looks forward with full confidence that improvement will continue to be made.

Although the fight against accidents will never be altogether won, management believes it to be the duty of all of us to consolidate our gains of the past, and to increase them in the future. All of these things can and will be done, only through the wholehearted cooperation and the united effort of the workers, supervisors and the management, with management, in its proper relations to safety, leading the way.

Symposium on Occupational Diseases

THE second annual symposium on occupational disease of the Department of Industrial Medicine of the Northwestern University Medical School will be held September 26 and 27 at Thorne Hall on the Chicago Campus of the University.

The program will include papers on industrial disease education, the scope of the occupational disease research problems, traumatic neurosis, the health of the worker in the shop and at home, industrial plant surveys, industrial health and the practicing physician, cardiovascular disease and peripheral vascular disease in middle aged groups of industrial workers.

At a final dinner session the subject will be the responsibility of labor management and the community, and morbidity and mortality statistics. The report of the proceedings will be published in pamphlet form early in September.

Abstracts

References and Bibliographies

THE following references to articles dealing with the many phases and ramifications of the foundry industry, have been selected by the Staff of the A.F.A. from current technical literature. For the benefit of those desiring copies of complete articles, a list of publications together with their addresses is given below:

Blast Furnace & Steel Plant, Thaw Building, 108 Smithfield St., Pittsburgh, Pa.

Proceedings, American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa.

Bulletin, British Cast Iron Research Association, 21-23, St. Paul's Square, Birmingham, England.

Bulletin de l'Association Technique de Fonderie, 44, rue de Rennes, a Paris (6e) France.

Canada's Foundry Journal, 85 Bellefair Ave., Toronto, Ont., Canada.

Foundry, Penton Building, Cleveland, O.

Foundry Trade Journal, 49 Wellington St., London, W.C. 2, England.

Industrial Gas, 9 E. Thirty-Eighth St., New York, N. Y.

Industrial Heating, Union Trust Building, Pittsburgh, Pa.

Industrial Relations, 844 Rush St., Chicago, Ill.

Iron Age, 239 W. Thirty-Ninth St., New York, N. Y.

Japan Nickel Review, Municipal Research Building, Hibiya Park, Tokyo, Japan.

Journal, American Ceramic Society, Twentieth and Northampton Sts., Easton, Pa.

Journal, Iron and Steel Institute, 28, Victoria St., London, S.W. 1, England.

Machine Design, Penton Building, Cleveland, O.

Mechanical Engineering, 29 W. Thirty-Ninth St., New York.

Metal Industry, 22, Henrietta St., Strand, London, W.C. 2, England.

Metal Industry, 116 John St., New York, N. Y.

Metal Progress, 7016 Euclid Ave., Cleveland, O.

Metals & Alloys, 330 W. Forty-Second St., New York, N. Y.

Metals Technology, 29 W. Thirty-Ninth St., New York, N. Y.

Mining and Metallurgy, 29 W. Thirty-ninth St., New York, N. Y.

National Bureau of Standards Research Paper, National Bureau of Standards, Washington, D. C.

Product Engineering, 330 W. Forty-Second St., New York, N. Y.

Refractories Journal, c/o South Yorkshire Times Printing Co., Ltd., 2 Paradise St., Sheffield, 1, England.

Steel, Penton Publishing Co., Cleveland, O.

Trained Men, International Correspondence Schools, Scranton, Pa.

Transactions, American Foundrymen's Association, 222 West Adams St., Chicago, Ill.

Transactions, American Society for Metals, 7016 Euclid Ave., Cleveland, O.

Welding, 108 Smithfield St., Pittsburgh, Pa.

When articles cannot be obtained from the original sources, photostatic copies may be obtained from the Engineering Society Library, 29 W. 39th St., New York, N. Y., which maintains photostatic service for engineering publications.

The A.F.A. also maintains extensive bibliographies on many foundry subjects and copies are available to members of the Association.

Alloy Steels

USES. *"Alloy Steels for Specific Uses,"* by V. T. Malcolm, *The Foundry*, vol. 66, no. 7, July 1938, pp. 32-3, 80. This is the first of three articles on this subject abstracted from a paper presented by the author at the Northwestern New York Conference at Cornell University, Ithaca, N. Y., in November, 1937. Special steels, according to the author, may be divided into the following classes: Those with high strength and toughness; those to resist wear; those to resist creep and elevated temperatures; those for welding; those for resistance to corrosion and oxidation, and those that are free-machining and non-sizeing. The author then discusses briefly the function of chromium, nickel, molybdenum, vanadium, tungsten, titanium, columbium, nitrogen, zirconium and selenium in these various type steels. Two tables show the chemical composition of a series of recommended steels and their heat treatment. He then lists the variables encountered in steel castings manufacture and discusses briefly the matter of casting losses. This section of the article closes with the pertinent observation that "experience has shown that there is no substitute for constant supervision."

Alloys

ALUMINUM. See Aluminum Alloys.

BEARING. See Non-Ferrous.

BERYLLIUM. See Non-Ferrous.

CAST IRON. See Cast Iron.

COPPER. See Cast Iron.

Aluminum Alloys

CASTING. *"Aluminum Casting Alloys,"* by G. Gurtler, *Foundry Trade Journal*, vol. 58, no. 1139, June 16, 1938, pp. 475-478. The author points out that the first problem in melting aluminum alloys for an effective removal of gas is to establish an equilibrium as completely and quickly as possible between the gassed melt and an atmosphere which is free from gas or contains only inert gases. Several methods are possible. A very effective method utilizes sodium chloride and sodium fluoride. A second and more difficult foundry problem is to prevent metal from reabsorbing gas while the mold is being filled. This tendency is reduced by lower pouring temperature, fast pour and fast cooling. The foundryman is not concerned with the total amount of gas present in the metal, but only that portion which is liberated during solidification and produces blowholes and gas cavities. The addition of titanium is used to improve the properties of some alloys. It is stated that the main types of alloys in use are those with principal additions of copper, silicon or magnesium. Heat-treatable alloys result from formations of Mg_2Si and $MgZn_2$. (Also *Metal Industry (London)*, vol. 52, no. 25, June 24, 1938, pp. 656-58.)

MELTING AND CASTING. *"Melting and Casting of Aluminum and Its Alloys," Metal Industry (London)*, vol 52, no. 17, April 29, 1938, pp. 452-454. An article issued by the British Aluminum Company, Ltd., giving an excellent summary of modern foundry methods, best calculated to produce sound, strong castings. The following topics are discussed: Crucibles, operation of furnace, temperature control, pyrometer couples, casting, molding, gates, risers and chills.

HEAT TREATABLE. *"Heat Treatable Aluminum-Silicon Casting Alloys,"* by G. G. Gauthier, *Foundry Trade Journal,* vol. 58, no. 1139, June 16, 1938, pp. 485-488. In this paper, alloys containing manganese and cobalt, sand cast, are discussed. The author gives the general procedure followed in his research, and tables give the variation of the mechanical properties under the influence of the heat-treatments. Influence of silicon, magnesium, sodium and iron are also given. (Also *Metal Industry (London)*, vol. 52, no. 24, June 17, 1938, pp. 631-636.)

Analysis

SPECTROSCOPIC. *"Spectrographic Analysis at a Large Technical Laboratory,"* by A. Mankowich, *Metals and Alloys,* vol. 9, no. 6, June 1938, pp. 131-137. The author of this article has described in detail some methods used at a large, technical laboratory, for the spectrochemical analysis of a wide variety of products. The steps involved in making a spectrograph are outlined, as is the method of preparing standard solutions and solutions for analysis. Several charts of working curves are included. Reasons are given to demonstrate that the graphic electrode-solution methods are preferable in a busy shop that cannot wait for metallic electrodes to be machined from the substance to be analyzed.

Bearing Alloys

ADHESION. See Non-Ferrous.

Beryllium Alloys

PROPERTIES. See Non-Ferrous.

Brass

HIGH STRENGTH. *"Some Physical Factors in Casting High-Strength Brasses,"* by J. E. Newson, *Foundry Trade Journal,* vol. 58, no. 1139, June 16, 1938, pp. 479-481, 484. The author points out that the mechanical properties of most alloys are influenced by the grain size, and the form and distribution of the constituents. Grain size is controlled largely by thermal conditions, and these conditions can be divided under two heads: (1) Those which are due to specific properties of the alloy itself and can only be varied by change of composition. These include specific heat, latent heat of fusion, thermal conductivity, the temperature and extent of the freezing range. (2) Those which can be varied under control by external means, such as the casting temperature and degree of superheat, and the nature and properties of the mold material. These various factors are discussed. The collective effect of the factors in the primary crystallization of brasses cast in sand is considered. The whole question of successful casting in all the commercial non-ferrous alloys is closely related to the thermal history and behavior of the metal throughout the melting, casting and cooling cycle. (Also *Metal Industry (London)*, vol. 52, no. 24, June 17, 1938, pp. 625-630.

Bronze Castings

HEAT TREATMENT. *"Heat Treating Zinc Bronze Pressure Castings to Close Leakage," Industrial Heating,* vol. 5, no. 6, June 1938, pp. 496, 498. Abstract of a paper presented by H. Fleck and T. C. Bunch at the 1938 Cleveland Convention of A.F.A.

Castings

APPLICATIONS. *"Castings Versus Forgings,"* by P. Clark, *Foundry Trade Journal,* vol. 58, no. 1138, June 9, 1938, pp. 458-460. An article sounding the praises of cast metals. The author estimates that if an analysis of failures of both castings and forgings were made, it would overwhelmingly reveal that more forgings fail in service than castings. The author further states that if technical institutions are to perform the highest service to students apprenticed to the foundry trade, they should concern themselves more with the theoretical than the practical by teaching methods of calculation, drawing, something of the properties of iron and steel, a study of molding sands and methods of testing. Practical training should be solely the function of the employer. The entire article is interesting reading, including an outstanding example of a marine replacement of a forged crankshaft with a casting. It is pointed out that castings exhibit no such directional weakness as axial or directional properties, possessed by forgings. With casting being improved by proper heat treatment, the future of cast materials will be much extended.

Cast Iron

ALLOY. *"Effect of Chromium on Growth of Commercial Cast Iron,"* by R. H. Smith, *Iron Age,* vol. 141, no. 23, June 9, 1938, pp. 29-31. The author has outlined the history of investigations on growth of cast iron at elevated temperatures, describes her investigation of the subject and presents microscopic evidence on the retarding effect of chromium on growth of cast iron. In the second article, the author gives her own views on why cast iron grows, together with a summary of data on the retarding action of chromium.

BORINGS. *"Use of Cast-Iron Borings,"* by A. Palmucci, *Foundry Trade Journal,* vol. 58, no. 1137, June 2, 1938, pp. 437-438. Translation of a paper presented to the Milan meeting of Italian foundrymen. The author states that cast iron borings can be remelted in (a) electric furnaces; (b) cupola, after briquetting and (c) cupola, after filling the borings into metallic containers. It is pointed out that cupola melting of cast-iron borings requires special control of the furnace to keep the metallic losses due to oxidation within reasonable limits. The pressure and the air volume should both be reduced in accordance with the percentage of borings added to the charge. The height of the melting zone above the tuyeres should be higher than normal. Briquetting plants are discussed, also melting of cast-iron borings in canisters. The cost of compressing cast-iron borings in canisters is approximately $3.25 per ton. When canister borings are melted and cast into pigs, the cost is approximately $20.00 per metric ton of pig. Metal loss varies from 7 to 10 per cent.

EFFECT OF COPPER. *"Copper in Cast Iron,"* by A. J. Nicol, *Foundry Trade Journal,* vol. 58, no. 1141, June 30, 1938, pp. 537-540. The first section of a paper presented at the annual meeting of the Institute of British Foundrymen. The fore part of the paper deals with the experimental procedure involved and the alloying of the copper. Results show that early additions of copper tends to graphitize the iron. This action continues up to 3.5 per cent copper after which the alloy seems to increase the chill. Copper is claimed to refine the graphite size. The limit of solubility of copper is about 3.5 per cent. In the presence of nickel, the limit is increased about 0.5 per cent. for each 1.0 per cent. nickel. It is difficult to precepitate copper by heat treatment and equally difficult to dissolve any free copper present. The introduction of copper into cast iron produces no marked changes in microstructure. Primary copper, described as copper appearing in globules apparent to the naked eye, begins to appear at 5.0 to 5.5 per cent. copper. The microscopic distribution of free copper begins to appear at about 3.5 per cent. copper. The solubility of copper does not seem to be dependent on chemical analysis of the iron. The alloy has a tendency to increase the transverse strength in quantities up to 2.0 per cent.; appears to decrease the deflection when free copper appears, as does the strength. So few tensile tests were made that no conclusions could be drawn. Copper increases the hardness of cast iron up to 3.5 per cent. after which further additions seem to soften it slightly. With regard to impact resistance, copper up to about 2.0 per cent. seems to increase the toughness of gray cast iron. After an investigation of the heat treatment possibilities, the author reached the conclusion that the benefits gained would not merit commercial application. On further investigation, the author found that copper accelerates the annealing of blackheart malleable iron and that maximum effect was obtained at 3.5 per cent. copper.

ENAMELING. *"Molding and Preparation of Castings for Enameling,"* by R. B. Schall, *Foundry Trade Journal,* vol. 58, no. 1137, June 2, 1938, pp. 445. The author discusses the difficulty of producing light castings perfectly flat, warping and buckling, parting lines and the importance of uniform casting section. The desirable features in design of enameling castings are: (1) Careful attention to clearance and tolerances; (2) accuracy of the pattern to insure proper fit upon assembling; (3) reproduction of pattern accuracy in each casting; (4) freedom from unusual warping and buckling on heating; (5) uniform section; (6) care in selection of parting lines; (7) breaking up of large flat surfaces; and (8) elimination of sharp edges. Abstracted from A.F.A. Preprint 38-21, presented at 1938 Cleveland Convention of A.F.A.

ENAMELING. *"Relation of Microstructure to the Enameling Properties of Cast Iron,"* by G. H. Spencer-Strong, *Foundry Trade Journal,* vol. 58, no. 1137, June 2, 1938, pp. 446, 448. Four major defects encountered in the enameling of cast iron may be caused either in part or entirely by the iron: (1) blistering; (2) failure of enamel to adhere properly to the iron; (3) warping of casting; (4) hairlining-formation of fine cracks in the enamel due to strains set up either during the enameling operation or in service. In this article, the author gives the various views expressed by investigators on the effect of blistering and failure of enamel to adhere. The latter two factors mentioned above are seldom contacted by metallographers. Abstracted from A.F.A. Preprint 38-5, presented at 1938 Cleveland Convention of A.F.A.

GRAPHITIZATION. *"Initial Stages of Graphitization,"* by H. A. Schwartz and M. K. Barnett, *Transactions American Society for Metals,* vol. 26, no. 2, June 1938, pp. 358-366. In this investigation, the authors have studied the curve connecting

graphite formed with heat treating time. There is evidence of a certain hesitancy, in annealing white cast iron, in the starting of the graphitizing reaction, the formation of graphite in the initial period of the process. It is concluded that the amount of graphite formed is not always proportional to the 1½ power of the time in the very beginning of the graphitizing reaction, but may be preceded by an interval in which the graphite formed is a linear function of time.

GRAPHITIZATION. *"Graphitization of High Purity Iron-Carbon Alloys,"* by Cyril *Wells, Transactions American Society for Metals,* vol. 26, no. 2, June 1938, pp. 289-357. Theoretical. This paper reports the results of research to produce graphite in iron-carbon alloys of very high purity, to accurately determine the iron-graphite diagram in the vicinity of the eutectoid transformation and study various factors that effect the graphitization process. A part of the author's summary states that graphite has been developed in relatively pure iron-carbon alloys at a temperature of 700°C. (1292°F.) and cementite has been shown to be unstable below 1125°C. (2057°F.). Under the same conditions of heat-treatment, the rate of graphitization was greater in a vacuum than in a hydrogen-hydrocarbon atmosphere. Miscoscopic studies have indicated that the presence of sufficient graphite nuclei will increase the rate of graphitization many hundred fold. It has been shown that graphite forms directly from austenite and as a decomposition product of cementite. The results apparently show that austenite of the same mass and carbon content may have, at the same temperature, a different volume depending on whether the carbon dissolved in it comes from graphite (and has the larger volume) or from carbide; the increase in volume is proportional to the amount of graphite dissolved in it. No adequate explanation is offered for the existence of two austenites.

HARDENABILITY. *"The Hardenability of Cast Iron,"* by D. W. Murphy and W. P. Wood, *Transactions A.F.A.,* vol. 9, no. 1, February 1938, pp. 571-598. The authors present data to illustrate the use of aluminum additions to molten iron to confer shallow-hardening properties on the iron. Aluminum additions of 0.02 to 0.03 per cent. produced a shallow-hardening iron; larger additions resulted in a deep-hardening iron. The melting practice prior to deoxidation with aluminum is a factor in establishing the conditions in the heat to obtain maximum effect on reduction of hardening power from a given aluminum addition. The aluminum addition did not appear to affect the amount or distribution of the graphite but did tend to produce large amounts of very fine pearlite in the as-cast condition. Chemical analysis does not indicate whether an iron is deep or shallow-hardening. Shallow-hardening irons appear to have a finer austenite network structure than the deep-hardening irons. Shallow-hardening irons, in the as-cast state, tend to show a slightly higher deflation rate in transverse test, a lower tensile strength and a considerably higher impact strength than the deep-hardening or coarse dendritic net-work structure irons.

Clay

DETERMINATION. *"A Sensitive Hydrometer for Determining Small Amounts of Clay or Colloids in Soils,"* by G. J. Bouyoucos, *Bulletin of the American Ceramic Society,* vol. 17, no. 6, June 1938, pp. 254. This article describes a hydrometer for the determination of small amounts of clay or colloids in soils and therefore should possibly be of use in clay determinations in molding sands. The instrument is calibrated to read from 0 to 10 grams per liter with 0.2-gram divisions. The following table shows the accuracy of the instrument:

DEGREE OF SENSITIVITY AND ACCURACY OF THE NEW SOIL HYDROMETER

Soils No.	Amount of clay in soil suspension: Indicated by hydrometer (%)	Amount of clay in soil suspension: Found by evaporating to dryness and weighing residue (%)
1	3.5	3.7
2	9.8	9.8
3	1.3	1.2
4	1.9	1.7
5	7.4	7.8
6	5.2	5.0
7	9.2	9.4
8	6.5	6.3
9	2.5	2.2
10	7.0	6.8

Cupola

REFRACTORIES. See Refractories.

Enameling

CAST IRON. See Cast Iron.

Cores

HARDNESS. See Sand.

Furnaces

INDUCTION. *"Induction Heating and Melting,"* by A. D. Meyer, *Canadian Metals and Metallurgical Industries,* vol. 1, no. 6, June 1938, pp. 166-70. This article describes the equipment used, and the proper power requirements, for induction melting furnaces. The melting practice also is described. The author then explains the use of the induction principle for heating steel for hot working and for surface hardening.

ROTATING. *"Melting Nonferrous Metals,"* by N. K. B. Patch, *The Foundry,* vol. 66, no. 6, June 1938, pp. 34, 108. A discussion of the reverberating or barrel type of melting furnace. A description is given of the types of barrel furnaces used, and various hints regarding their maintenance and operation. Gas or oil are used as fuel. Some have a burner on one end only and others have burners at both ends. These furnaces are capable of rotation, to some degree, which permits greater opportunity for heat absorption by the metal from the lining. It is necessary to watch the flame carefully to avoid gassed metal. Capacity varies from 150 to 24,000 lb. in the different types of furnaces, four of which are illustrated.

Graphitization

CAST IRON. See Cast Iron.

Heat Treatment

ALUMINUM ALLOYS. See Aluminum Alloys.

BRONZE. See Bronze Castings.

Maintenance

FOUNDRY. *"Importance of Maintenance to Foundry Operation,"* by W. C. Bliss, *Mechanical Engineering,* vol. 60, no. 6, June 1938, pp. 489-90. This article emphasizes the requirements of keeping the foundry in operation 24 hours per day. The author explains the necessity of keeping replacement parts on hand and to anticipate breakdowns. Perfect molds must be produced or the loss is great. He divides his discussion between the following topics: Lubrication, the need for spare parts, the functions of the magnet, sand handling equipment, cleaning room and the provisions that must be made for repairs, replacements and safety.

Malleable Iron

ANNEALING. *Factors Influencing the Annealing of Malleable Iron," Industrial Heating,* vol. 5, no. 6, June 1938, pp. 504-506. Abstract of a paper presented by A. L. Boegehold, General Motors Research Laboratory, at the 1938 Convention of A.F.A. in Cleveland.

APPLICATIONS. *"What Is Made of Malleable Iron,"* by Enrique Touceda, *Metals and Alloys,* vol. 9, no. 6, June 1938, pp. 151-156. In this article, the author, by illustrations and effective logic, has again called attention to the desirable engineering properties, both static and dynamic, possessed by malleable iron. Only the "standard" malleable is considered. The many applications of malleable to the auto industry is stressed and an analysis of the reasons of its qualifying for the particular service is given. Malleable is being used because it has a relatively high yield strength, good elongation, good impact properties as well as ease and speed in machining operations. Castings have the advantage in being free of directional properties. Another aspect of physical performance is the reduction of area feature possessed by malleable. The reduction of area tends to be distributed throughout the stressed section. Malleable iron also exhibits an unusual relation between the tensile strength and elongation; these two vary directly, and this is almost unique among ferrous materials. Its use for agricultural purposes is stimulated by its resistance to shock and corrosion resistance. Railroads also consume much malleable. Railroad malleable requirements are high elongation, high yield and strength, also shock and corrosion resistance.

Malleable Castings

DESIGN. *"Design for Malleable Castings Is Important,"* by J. H. Lansing, *The Foundry,* vol. 66, no. 7, July 1938, pp. 22, 23, 71, 72. This is a good article embodying the fundamental principles of the design of malleable castings. Accompanying the article, is a series of illustrations showing outstanding examples of what can be secured by proper design of castings. Many of the illustrations show parts now made in malleable iron that formerly were made by other methods of fabrication.

Melting

CUPOLA. *"Practices Close Cupola Control,"* by M. J. Gregory, *The Foundry,* vol. 66, no. 6, June 1938, pp. 38-41, 115-116; no. 7, July, 1938, pp. 24-27, 74. This is the first of two articles on this subject. Descriptive of manipulative details in handling of materials. Cost of handling material in the cupola is approximately 12 cents per ton. Cost of iron at the spout, which includes all materials and other accounting items, has been around 1 cent per pound. Metal loss, during cupola melting, was found to average 4.66 per cent. of the charge over a period of 26 days. The second of the two articles deals, in the first portion, with instruments for control of cupola operation and the disposition of the slag. The remainder of the article discusses the various types of irons produced by the company with which the author is associated, including metal mixtures, melting rates, bed heights, analyses, physical prop-

erties, etc. Of particular interest is what the author has to say about the impact test developed by the Caterpillar Tractor Company for cast irons.

INDUCTION FURNACE. See Furnaces.

NON-FERROUS. See Furnaces.

Molding

RANDUPSON PROCESS. *"The Randupson Process of Cement Molding,"* by F. W. Rowe, *Foundry Trade Journal,* vol. 58, no. 1140, June 23, 1938, pp. 520-526. This process, an invention of a French engineer, Durant, consists of the use of silica sands bonded with ordinary Portland cement and water in place of the more usual molding sands. This sand-cement-water mixture is rammed around patterns mounted in wooden boxes or coreboxes or strickled in the manner usual with loam sands. The sand is reinforced at various points with straight irons, and staples are embedded where necessary for lifting. The resulting molds or cores are set aside to harden for periods varying from 24 to 48 hours, blocked if necessary, then the various parts are clamped together and cast without any surrounding box parts. The molds or cores, after they are set, have great mechanical strength and very high permeability. After casting, the molds are stripped in the usual manner and the sand crushed, desilted and stored for use over again. The outstanding feature of the process depends upon a well-defined ratio between the amount of water used and the quantity of cement to ensure the high permeability, which is much higher in value than that obtained with other types of molding sand.

Management

ADDRESS. *"Some Management Opportunities and Responsibilities,"* by C. R. Hook, an address sponsored by the Board of Awards of the A.F.A. given at the Cleveland Convention, May 18, 1938. In his brief talk, the speaker has indicated the ills of this country which have almost produced a standstill in business and also gives a program of recovery. At present, there is an outstanding opportunity to defend our system of individual incentive or private enterprise. The opponents of this system "are not to be dismissed lightly, for they have insidious and effective weapons." It is pointed out that the immediate objective is to put men back to work. Further, if proper incentives were restored, private investors and private enterprise would release private funds which would far overshadow government efforts of pump-priming. The program of industry is outlined, and part of the plan includes: (a) Constructive steps by government to create confidence in the fundamentals of the private enterprise system; (b) declaration by the Federal government that it will not proceed in competition with private utilities; (c) cooperation between all groups to increase the National income; (d) avoidance of new Federal reform legislation that will result in a fresh period of uncertainty; (e) solution of the underlying railroad problem; (f) administering of relief by experienced local agancies; (g) revision of the Wagner Act. The government should give a confidence-building policy.

Non-Ferrous

ALUMINUM ALLOYS. See Aluminum Alloys.

Non-Ferrous

BEARING ALLOYS. *"The Adhesion of Bearing Alloys,"* by E. Wood, *Metal Industry (London),* vol. 52, no. 22, June 3, 1938, pp. 569-573. In this article, the author describes an investigation into the adhesion of the white metal used in big-end bearings for high duty aero-engines. An original experimental procedure is given which includes grading by chisel test, x-ray and micro-examination, etc. In conclusion, the author summarizes the salient features of the work and gives some useful recommendations for the preparation of adhesive layers.

BERYLLIUM. *"Beryllium and Berylliun-Copper-Properties and Applications,"* by C. B. Snyder and B. R. Kjellgren, *Metal Industry (London),* vol. 52, no. 20, May 20, 1938, pp. 533-535. This article is a condensed version of an original paper presented before the American Chemical Society. In the present article, the properties of metallic beryllium are discussed and also the age-hardening and mechanical properties of beryllium-copper alloys as are the applications of these alloys to industry. The cost of beryllium is quoted as $23 per lb., alloyed with copper.

FOUNDRY PRACTICE. *"Non-Ferrous Foundry Practice,"* by J. Laing and R. T. Rolfe, *Metal Industry (London),* vol. 52, nos. 9, 10, 11, 13, 15, 22, 23, March 4, March 18, April 1, April 15, June 3, June 10, 1938, pp. 255-60, 307-10, 355-58, 405-8, 575-8, 601-4, respectively. This is a series of articles by the authors covering many phases of non-ferrous practice in connection with the various types of metals manufactured there. The first section deals with molding sands and discusses such topics as fineness, permeability, effect of grain size and clay content, permeability tests, factors affecting permeability, effect of permeability on molding method, refractoriness and durability, sands for phosphor bronze, sands, for copper-nickel alloys, sands for aluminum alloys, core sands, etc. The second section deals with melting units while the third begins a discussion on bronzes, and deals more particularly with the phosphor bronzes. The next section deals with gun-metal and explains the micro-structure and the effect of aluminum, antimony, arsenic, bismuth and iron as impurities. The next section discusses such subjects as the effect of lead and its segregation, tin sweat, effect of nickel, etc. The final section discusses tests for non-ferrous alloys. Section 8 gives the intracacies of the manufacture of high-quality gun metal, covering such topics as melting procedure, effect of remelting, results of casting at unsuitable temperatures, positions of gates and risers, etc.

MELTING. *"Improvements in Crucible Melting,"* by R. D. Hawkins and O. D. Pritchard, *Industrial Gas,* vol. 16, no. 12, June 1938, pp. 12-13. This article extols the virtues of a stationary type crucible furnace described as a bell-type. It is claimed that this type furnace eliminates lining abrasion from tongs. The furnace is lined with a 2800°F. insulating refractory backed by a high temperature refractory such as sillimanite or mullite of the rammed type. The insulating refractory is faced with an air-set wash. Tunnel-type burners with low-pressure, single-valve, proportional mixers are used. On large installations, multiple burners are used and single burners on small furnaces. It is claimed that in some cases as low a gas consumption as 3.5 cu. ft. per lb. of metal has been secured.

MELTING. *"Melting Non-Ferrous Metals,"* by N. K. B. Patch, *The Foundry,* vol. 66, no. 7, July 1938, pp. 28, 77. In this article, the author deals with the proper attention that should be given refractories in non-ferrous melting furnaces. In the fore part, he warns against too rapid drying of monolithic linings and then with the proper charging methods for cylindrical, reverberatory furnaces, especially as the charging affects lining life. He then discusses furnace atmospheres, the value of securing complete fuel combustion, the proper installation of burner equipment and methods of securing proper data on the life and cost of linings. Because of the fact that linings absorb metal, the author points out the desirability of melting the same types of alloys in the same furnace. With regard to ladles, these should be used only for the specific alloys which they are used to pour. Promiscuous use of ladles for all types of alloys melted in a shop should be discouraged if contamination is to be avoided.

SILICON. *"Silicon in Non-Ferrous Castings,"* by H. W. Gillett, *Metal Industry (London),* vol. 52, no. 20, May 20, 1938, pp. 529-532; no. 21, May 27, pp. 551-553. A summary of the alloying properties of silicon. The author discusses the properties and sources of silicon and goes on to describe the use of silicon in magnesium-base, aluminum-base and copper-base alloys. He gives specifically the properties of low silicon-aluminum alloys, aluminum die-castings and a special piston alloy, and explains in detail the effects of tin, zinc, manganese and iron on the copper-silicon alloys. The author further discusses the foundry behavior of the copper silicon alloy series and tells of the functions of nickel in copper-silicon alloys. The role of silicon in cupro-nickel, monel metal and other nickel-base alloys are discussed and a general summary of the uses and potentialities of silicon are given.

Refractories

CUPOLA. *"Effect of Cupola Practice on Linings," Industrial Heating,* vol. 5, no. 6, June 1938, pp. 545-6. Abstract of paper by C. K. Donoho and C. F. Greene presented at the 1938 convention of A.F.A. in Cleveland.

SERVICE. *"Refractory Service Increased Through Study of Problem,"* by S. M. Swain, *The Foundry,* vol. 66, no. 7, July 1938, pp. 29, 30, 78. In analyzing refractory problems the author lists the various steps to determine the data desired as follows: (1) Determine the most apparent or likely destructive force acting on the refractories; (2) determine other contributing factors; (3) check the service facotrs and their relations to the problem; (4) evaluate the data so obtained. Forces destructive to refractories are divided as follows: Soften at high temperatures; structural changes at high temperatures; spalling; abrasion; slag attack or solution; erosion. The author then outlines the probable causes of failure under each of the conditions mentioned.

Sand

CORE HARDNESS. *"A Study of Core Hardness,"* by H. W. Dietert and Earl Woodliff, *Transactions A.F.A.,* vol. 9, no. 1, February 1938, pp. 545-562. In this article, the authors have considered the various factors that influence the hardness and strength of a core. The procedure in performing the tests is described fully. It was found that a baking temperature of 350°F. gave maximum strength. Maximum strength (and hardness) was also maintained in 1½ hours. A moisture content of 6 per cent gave strength values almost equivalent to no moisture. A minimum tensile strength resulted at 3.5 per cent water. The highest hardness and tensile strength values were obtained on sands of 100 mesh size.

DURABILITY. *"Correlation of the Physical and Chemical Properties of Clays with the Durability of Molding Sands,"* by C. E. Schubert, *Transactions A.F.A.*, vol. 9, no. 1, February 1938, pp. 661-690. Six sands and three methods of test were used in this investigation. The author describes the various tests and the equipment used and gives results obtained for green and dry permeability, green and dry compression, clay content and fineness tests. The mineralogy and chemistry of the bonding substances were also investigated. Results indicate that it is not possible to predict the life of molding sands by any of the three methods and that it more economical for foundrymen to add bond after the sand has been used for a number of heats than to hold the strength constant by frequent additions of bond. Durability depends upon the physical and chemical properties of the mineral or minerals in the bond.

TESTING. *"Evaporating the Hot Water with Burning Alcohol as a Rapid Means of Determining Moisture Content of Soils and of Molding Sands,"* by G. J. Bouyoucos, *Bulletin of the American Ceramic Society*, vol. 17, no. 5, May 1938, pp. 203-6. The author describes a method for securing the water content of soils and molding sands by evaporating the water by the use of ignited alcohol. The method is based on the fact that water will dissolve in alcohol and that alcohol containing up to 45 per cent water will burn and its water content evaporate. The following are necessary to perform the test: (1) a special metal cup, 2-in. diameter by 1-in. high, with perforated bottom and standing on four narrow legs ¼-in. high, (2) metal cup about 3-in. diameter by 1-in. high with solid metal bottom, (3) pair of laboratory crucible tongs, (4) filter paper to fit the bottom of the perforated cup, (5) a high-grade, triple beam balance, sensitive to about 0.01 gram, and (6) methyl alcohol. The procedure is as follows: Place cup (2) inside cup (1) and weigh together. Place about 20 to 25 grams of sample in cup (2) and reweigh. Place about 25 cc. of methyl alcohol on sample and after it has drained through sample, ignite. After alcohol has burned off, reweigh. Repeat procedure until constant weight is reached. By this method it is claimed that the moisture content of sands can be determined in 5 to 10 min., loams in 10 to 20 min. and clays in 10 to 35 min., depending on their water content and permeability to alcohol.

TESTING: *"Some Factors in Sand Testing,"* by T. R. Walker, *Foundry Trade Journal*, vol. 58, no. 1138, June 9, 1938, pp. 455-456; no. 1139, June 16, 1938, pp. 483-484. Practical discussion of sand testing, pointing out differences in the British and American methods of testing sands, and giving some very interesting data on the time-moisture effect on molding sands. The author points out that in the A.F.A. standard rammed specimen, the relative density of the cylinder will vary with the type of sand. In addition, the density of the cylinder will not be uniform in every part, but will be greatest under the ram. The test specimen used by the British Cast Iron Research Association is rammed on both ends, thus insuring more uniform density throughout the specimen, and may be of any desired relative density. The energy absorbed by the specimen is not constant, but varies according to the relative density of the specimen. It is pointed out that the A.F.A. method is simple, rapid, and, for practical purposes, sufficiently accurate. It is further stated that for research work, the variation of properties caused by an alteration in relative density should be taken into account. The data submitted in table and graph shows: (1) Increase in water causes green strength to increase to a maximum, then decrease; (2) the higher the density of specimen, the greater the green strength; (3) using bentonite as a bond, strength of green specimens increased with time of standing; (4) dry strength decreases to a constant on standing.

Silicosis

CONTROL. *"Suggestions for the Control of Silicosis in Mining,"* by D. E. Cummings, *American Institute of Mining and Metallurgical Engineers, Tech. Pub. No.* 930, 1938. Although written primarily for the mining industry, there is a strong parallel between conditions surrounding silicosis in both the mining and founding industries. The article is very well written and authoritative. Only a few excerpts are given here, namely: The peril incurred by the inhalation of harmful dust is a function of two variable factors—the degree of harmful exposure and the specific susceptibility of the exposed individual to pulmonary injury. In general, individual susceptibility to injury from dust is reduced as age increases, while the susceptibility to chronic infections varies with age and the habits of living and work. A mine atmosphere is potentially dangerous at any point where the concentration of silica particles between 0.5 and 10 microns in size exceeds 15,000,000 to 20,000,000 particles per cubic foot of air (or 0.02 milligrams of silica per cubic ft. of air).

SURVEY. *"Silicosis in the Foundry Industry,"* by Leonard Greenburg, Reprint *no.* 38-35, *American Foundrymen's Association, Safety and Hygiene Section.* This article gives the results of a survey made in the foundries of New York State. The methods followed in selecting the foundries and the men engaged in these foundries is fully described. Of the 4,754 workers examined, 191 or 4 per cent were fibrotic. The highest percentage of those workers having fibrosis had been in foundries 20-24 years. Of the 4,066 foundry workers examined, 2.7 per cent were found to have silicosis. No silicosis was found among patternmakers. Data indicates that the longer the foundry exposure, the greater is the number of silicosis cases. This particular study showed a higher percentage of silicosis in smaller foundries, employing less than 15 men. Cases of fibrosis and silicosis appeared to be higher in steel foundries (3.7 per cent) as compared to iron (2.7 per cent) and nonferrous (2.8 per cent) or combined foundries (2.4 per cent). The occupation showing the highest silicosis rate was chipping (4.8 per cent). From the point of view of tuberculosis, foundrymen appear to be a fairly normal group (0.7 per cent). In general, the article is a splendid contribution of facts on the subject and will do much to allay the fears and unfavorable public sentiment regarding dust hazards in the foundry industry.

Spectrograph

ANALYSIS. See Analysis.

Steel Castings

ALLOY. See Alloy Steels.

APPLICATIONS. *Steel Castings Prove Merit as Large Intricate Parts,"* by F. K. Donaldson, *Machine Design*, vol. 10, no. 6, June 1938, pp. 41-2, 85. This article shows what can be done in the steel foundry toward casting complicated intregal shapes. The author uses as an illustration a cast steel trolley frame for a crane. The company, for which they have been manufactured, has made over 700 cranes with these castings incorporated within the past 15 years. There has not been a single failure. The author also cited the casting of Diesel cylinder blocks successfully in steel as an indication of what can be accomplished by this method of fabrication.

EFFECT OF MASS. *"Effect of Mass Upon the Mechanical Properties of Cast Steel,"* by C. W. Briggs and R. A. Gezelius, *Transactions American Society for Metals*, vol. 26, no. 2, June 1938, pp. 367-407. The purpose of this investigation was to study and set forth, as simply as possible, the effect of mass upon the mechanical properties of cast steel. Some of the conclusions arrived at are listed: (1) There is a loss in strength and ductility as measured at the center of the section, as the mass increases, (2) in carbon steel, the loss is pronounced for the first 2-in. of cross section, after which it tapers off gradually, (3) there is a decrease in density and carbon content, and an increase in Izod impact value as mass increases, (4) the decrease in physical properties as mass increases is a result of the type of microstructure developed, carbon segregation and low density values, (5) differences in pouring temperature have no marked effect on the mechanical properties. From these and other results, it appears that the effect of mass on physical properties of cast steel is not particularly damaging. The article is followed by a very good discussion.

PRACTICE. *"Steel Foundry Practice Requires Planning,"* by W. J. Corbett, *The Foundry*, vol. 66, no. 6, June 1938, pp. 36-37, 110, 112. The purpose of this article is to deal with some of the principal details considered by steel foundrymen before production actually commences. Much of the article is devoted to preparing the pattern, proper pattern-makers shrinkage and the task of eliminating shrinkage defects by proper use of gates, risers, brackets, chills and molding and core practice. Some pattern-makers use a 3/16-in. shrink rule for dry sand work and ¼-in. shrink rule for green sand. Allowance for finish machining may vary from ⅛ to ⅜-in. All these figures are subject to variation. No definite rules can be prescribed in regard to the use of risers. The ideal design of casting, from the founding aspect, is that of a wedge with the large end as the cope side. Castings of this type are rare, hence the foundryman is often called upon to use considerable ingenuity and draw on past experience when establishing gating and risering methods. Consideration must also be given to the removal of gates, risers and brackets. It is suggested that brackets should be used freely, better higher cleaning costs than a defective casting. Chills are used, both internal and external. Importance of venting core and mold is also discussed.

Structures

BANDED. *"Banded Structure in Cast Materials,"* by F. Roll, *Foundry Trade Journal*, vol. 58, no. 1130, April 14, 1938, pp. 306-8, 312. A discussion of the causes of banded structures found in cast and malleable irons. In banded structures found by the author, in each case the pearlitic rims were located in sections where sulphur concentrations were highest. The author explains the possibility of such structures by gas reactions within the metal and by the migrations of these gases into and out of the center of the sections.

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